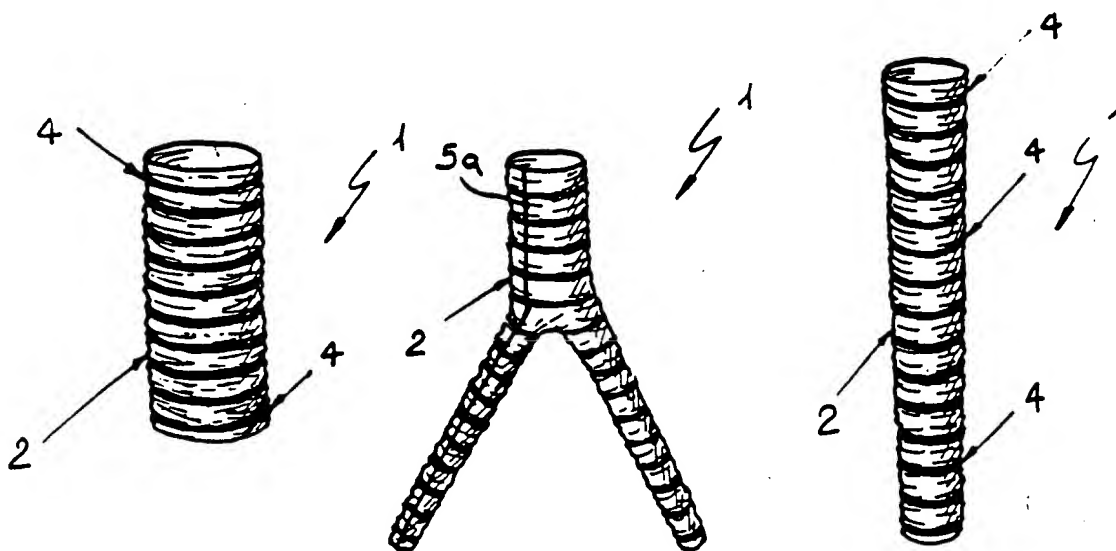




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification⁴ : A61F 2/06</p>	<p>A2</p>	<p>(11) International Publication Number: WO 88/ 06026 (43) International Publication Date: 25 August 1988 (25.08.88)</p>
<p>(21) International Application Number: PCT/EP88/00115 (22) International Filing Date: 17 February 1988 (17.02.88) (31) Priority Application Number: 19405 A/87 (32) Priority Date: 17 February 1987 (17.02.87) (33) Priority Country: IT (71)(72) Applicant and Inventor: ARPESANI, Alberto [IT/IT]; Piazza S. Angelo, 1, I-20121 Milano (IT). (74) Agent: RAPISARDI, Mariacristina; Studio Tecnico Legale Rapisardi, Largo V Alpini 15, I-20145 Milano (IT). (81) Designated States: AT (European patent), BE (European patent), CH (European patent), DE (European patent), FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), NL (European patent), SE (European patent), US.</p>		<p>Published <i>Without international search report and to be republished upon receipt of that report.</i></p>

(54) Title: INTERNAL PROSTHESIS FOR THE SUBSTITUTION OF A PART OF THE HUMAN BODY PARTICULARLY IN VASCULAR SURGERY



(57) Abstract

Internal prosthesis for the substitution of a part of the human body particularly in vascular surgery, which has a body (2) with a substantially tubular configuration, made of plastic material tolerated by the human body and suitable for being associated by its free ends, through a suture, to the ends of one or more arteries; advantageously the body defining the prosthesis is radiopaque so that it can be easily detected by means of an X-ray apparatus.

INTERNAL PROSTHESIS FOR THE SUBSTITUTION OF A PART OF THE
HUMAN BODY PARTICULARLY IN VASCULAR SURGERY.

Technical field:

This invention relates to an internal prosthesis for the
substitution of a part of the human body, particularly in
vascular surgery.

Background Art:

As it is known, vascular surgery together with orthopedic
5 surgery is the one which mostly profited by the introduction
of prosthetic materials.

The first substitutions of arterial trunci go back to few
decades ago, when the homologous graft technique was
introduced, i.e. the substitution of the injured or ill part
10 with a similar segment taken from a corpse.

Preserved human arteries had been for many years the
substitutive material of choice; however, the difficulties
related to the timely finding of arterial parts of special
size and shape, the need to depend on "arteries banks", and
15 the frequent technical problems related to anastomosis
caused a gradual reduction in the field of their application
when substitutive plastic materials were introduced on the
market.

The ideal material for vascular prosthesis should include
20 essentially the following features: it should not have any
toxic, allergic or carcinogenic action, it should be

cular surgeons in order to detect the prosthesis detachment in the suture are x-ray, echography, angiography, i.e. blood column detection, or more recently C.A.T. (Computerized Axial Tomography) and N.M.R. (Nuclear Magnetic Resonance).

- 5 In the case of angiography, the detection of the blood column does not always allow the pathology to be detected, by x-ray the evidence of pathology is almost impossible as the prostheses currently available on the market are not radiopaque; on the contrary, by C.A.T. or N.M.R. and by
10 echography a section detection of the pathology is possible even if it is very difficult to detect and quantify any displacement of the prosthesis end from the artery end.

Disclosure of the invention:

- The main object of this invention is to overcome the above-mentioned drawbacks by making an internal prosthesis
15 for the substitution of a part of the human body particularly in vascular surgery, which allows the detection of its positioning by means of a simple x-ray apparatus.
Within this scope of the invention, a relevant object of the invention is to design a prosthesis allowing the detection
20 and the quantification of its displacement from the artery to which it was connected.

Another object of the invention is to make a prosthesis which, even if it allows an easier detection, has the same functional properties of the current prostheses.

the prosthesis in accordance with the invention, globally referred to under the reference number 1, has a body, generally referred to as 2, which generally is made of plastic material tolerated by the human body such as some acrylic resins and some ethylene polymers.

Suitably, according to the type of vascular surgery to be performed, the body 2 has different configurations that are all substantially tubular and that in particular might be also cylindrical, "Y"-shaped, or tapered, as shown by way of example in Figure 1, and that are able to possess among the basic requirements a high degree of elasticity, a good porosity and enough permeability to migrating cells.

Advantageously, in accordance with the invention, the body 2 is also radiopaque so that the vascular surgeon can accurately determine its position relatively to one or more ends 3 of the arteries by means of an x-ray apparatus of standard type and/or while making the angiography.

More in details, the body 2, defining the prosthesis, can be for instance made radiopaque, as we already said, by means of a suitable processing or by coating or inserting in its wall a radiopaque fabric.

In a preferred embodiment, but not limited thereto, the body 2 has radiopaque surface portions developing without discontinuity over its entire surface, more precisely said radiopaque portions, generally referred to as 7, show an

precisely they are visible to the naked eye so to make the surgeon's task easier during vascular surgery, i.e. during the execution of the anastomosis at the level of one of the radiopaque rings.

- 5 Finally, the radiopaque portions can also have a stain different from the stain of the body 2 and/or from each other in order to better stand out on the same.

Furthermore, it shall be specified that beside the radiopaque portions having an annular development, the body
10 2 can have a filiform element 5a extending along the longitudinal development of the body 2 and its branches.

The operation of the prosthesis in accordance with the invention is evident from what has been described and illustrated herein; in particular, it can be specified that
15 during vascular surgery the surgeon will cut, according to the needs, a prosthesis length just close to one of the radiopaque portions with annular development so that the latter is at the connection with the artery end and allows later the accurate detection of the connection between
20 artery and prosthesis.

In practice, it has been noticed that the prosthesis in accordance with the invention turns out to be extremely advantageous as it allows, by means of a simple x-ray apparatus now existing in all hospital centers, its
25 detection and correct positioning relatively to the artery

Claims:

- 1 1.- Internal prosthesis for the substitution of a part of
2 the human body particularly in vascular surgery having a
3 body with a substantially tubular configuration of plastic
4 material tolerated by the human body and suitable for being
5 associated by its free ends, by cross or oblique suture, to
6 the ends of one or more arteries, characterized in that said
7 body is radiopaque.
- 1 2.- Internal prosthesis for the substitution of a part of
2 the human body particularly in vascular surgery having a
3 body with a substantially tubular configuration of plastic
4 material tolerated by the human body and suitable for being
5 associated by its free ends, by suture, to the ends of one
6 or more arteries, characterized in that said body has
7 radiopaque surface portions developing without discontinuity
8 over its entire surface.
- 1 3.- Prosthesis according to claims 1 and 2, characterized
2 in that said radiopaque portions are defined by a filiform
3 element.
- 1 4.- Prosthesis according to claims 1 and 2, characterized
2 in that said radiopaque portions are defined by a fabric.
- 1 5.- Prosthesis according to one or more of the preceding
2 claims, characterized in that said radiopaque portions have
3 an annular development.
- 1 6.- Prosthesis according to one or more of the preceding

Fig. 1

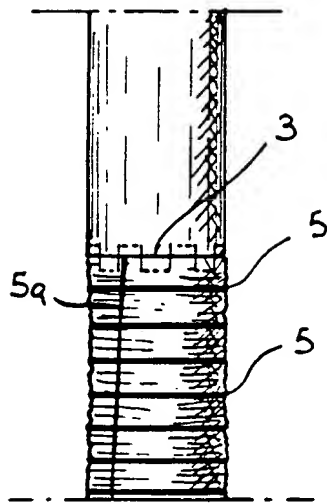
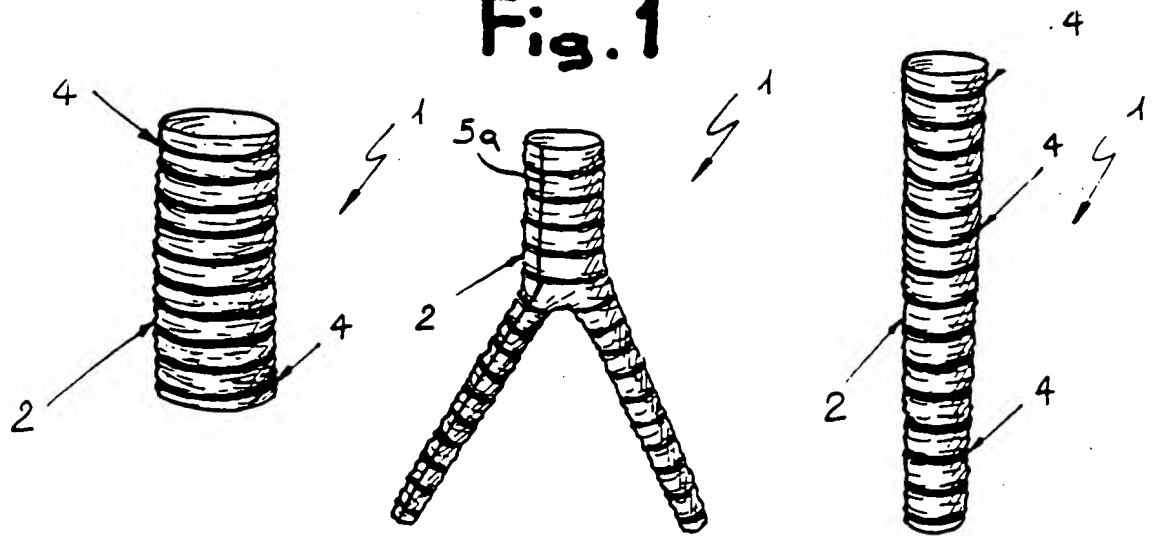


Fig. 2

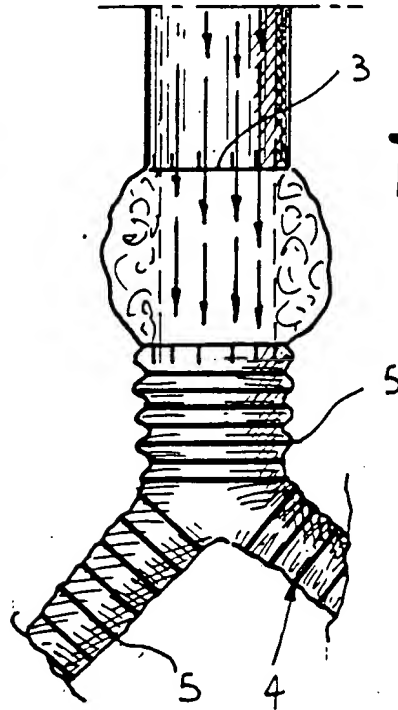


Fig. 3

Fig. 4

